BRUHATH BANGALORE MAHANAGARA PALIKE
BYATARAYANAPURA DIVISION

Name of the work: Package No.01 (Package consists of 18 works)

Second and Part Bill
Test Reports

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CONSULTANTS

No. TC / BBMP / RI / BYT-PMC / 308 / 18 – 19 Date:

To
The Executive Engineer
Byatarayanapura Division,
Bruhat Bangalore Mahanagara Palike,
Bangalore.

Dear Sir

Sub: **Package No.01 (Package consists of 18 works).**

In reference to the above subject, this is to bring to your kind notice that we have scrutinized the **Second RA bill** submitted by Sri D Narahari, Bangalore, towards the above said work and arrived at an amount of **Rs. 16079478.11/-(Rupees One Crore Sixty Lakh Seventy Nine Thousand Four Hundred Seventy Eight and Paise Eleven Only)**. The work has been completed satisfactorily.

This is for your kind information.

Thank you and assuring you the best of our Services at all the times

TEJUS CONSULTANTS

For Tejus Consultants
(Nischal M)

TEJUS CONSULTANTS
No. 58, 3rd main, 6th Cross, 1st Stage KHB Colony, Basaveshwaranagar, Bangalore - 560079. O : +91 80 23287532, tejusconsultants@gmail.com

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BRUHATH BANGALORE MAHANAGARA PALIKE
BYATARAYANAPURA DIVISION

Name of the work: Improvement to Drains and Asphalting to Roads at Hegadenagara Eastern Side Cross Roads in Ward No.06(Thanisandra), Byatarayanapura Sub Division

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DETERMINATION OF RATE OF SPREAD TACK COAT

TEJUS CONSULTANTS

Name of Work :	Improvement to Drains and Asphalting to Roads at Hegadenagara Eastern Side Cross Roads in Ward No.06(Thanisandra), Byatarayanapura Sub Division
Client :	BRUHAT BANGALORE MAHANAGARA PALIKE
Consultant :	M/s Tejus Consultants
Contractor :	Benaka Developers and Project Pvt. Ltd.
Date of Testing :	25.04.19
Type of Mix :	Tack coat
Sample I/D :	1

Determination	Unit	Test No		
		1	2	3
Size of Plate (mxm)	Mt	0.30 x .30	0.30 x .30	0.30 x .30
Area of Plate (a)	Sq.mtr	0.09	0.09	0.09
Initial Wt of empty Plate (b)	Kg	0.818	0.815	0.818
Final weight of plate after application of tack Coat (c)	Kg	0.841	0.838	0.841
Weight of tack Coat (d=c-b)	Kg	0.023	0.023	0.023
Rate of spread of tack coat	Kg/sq.m	0.250	0.256	0.251
Average	Kg/sq.m	0.252		
Specified Limit	Kg/sq.m	**0.250 Kg/sq.m**		

Note:

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ಬಿ.ಬಿ.ಎಂ.ಪಿ ಬ್ಯಾಟರಾಯನಪುರ ಉಪ ವಿಭಾಗ

ಸಹಾಯಕ ಕಾರ್ಯಪಾಲಕ ಅಭಿಯಂತರರ
ಬ್ಯಾಟರಾಯನಪುರ ಉಪ ವಿಭಾಗ
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BITUMEN CONTENT AND GRADATION DETERMINATION OF BITUMINOUS CONCRETE MIX

ame of Work :	Improvement to Drains and Asphalting to Roads at Hegadenagara Eastern Side Cross Roads in Ward No.06(Thanisandra), Byatarayanapura Sub Division
lient :	BRUHAT BANGALORE MAHANAGARA PALIKE
onsultant :	M/s Tejus Consultants
ontractor :	Benaka Developers and Project Pvt. Ltd.
ate of Testing :	25.04.19
ype of Mix :	BC
mple I/D :	BC1

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DETERMINATION OF BITUMEN CONTENT

Description	Trail 1	Trail 2
Weight of Mixture before extraction, g	953	926
Weight of Mixture after extraction, g	900	887
Weight of Bitumen	53	39
Weight of filter paper before extraction, g	2.00	2.00
Weight of filter paper after extraction, g	4.10	4.00
Weight of fines, g	1.40	1.70
Weight of Bitumen & fines	54.40	40.70
Bitumen content in %	5.71	4.40
verage Bitumen content in %	5.05	
Minimum Bitumen content in %	5.40	

GRADATION FOR BC AFTER EXTRACTION
(As per MORT&H 500-18,Grading-2)

mple Location:	At site	Date of Sampling:	26.04.19
e of material & pose:	BC	Date of testing:	26.04.19
		Oven Dry Wt.(gms):	900.0

Sieve size in mm	Weight retained	Cummulative weight retained (gm)	Cummulative % of retained	Cummulative % of passing	Specification limits
19.00	0	0	0.00	100.00	100.00
13.20	92	92.0	10.22	89.78	79 - 100
9.50	118	210.0	23.33	76.67	71 - 95
4.75	134	344.0	38.22	61.78	53 - 71
2.360	117	461.0	51.22	48.78	42 - 58
1.180	106	567.0	63.00	37.00	34 - 48
0.600	72	639.0	71.00	29.00	26 - 38
0.300	73	712.0	79.11	20.89	18 - 28
0.150	58	770.0	85.56	14.44	12 - 20
0.075	70	840.0	93.33	6.67	4 - 10
Pan	60.0				
Total	900.0				

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ed in the laboratory/Site.
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AGGREGATE IMPACT VALUE
(IS: 2386 Part - 4)

TEJUS CONSULTANTS

Project	Improvement to Drains and Asphalting to Roads at Hegadenagara Eastern Side Cross Roads in Ward No.06(Thanisandra), Byatarayanapura Sub Division		
Client	BRUHAT BANGALORE MAHANAGARA PALIKE		
Consultant	M/s Tejus Consultants		
Contractor	Benaka Developers & Project Pvt.Ltd.		
Proposed Use	BC	Date of Sampling	26.04.19
Sample Location	At plant	Date of Testing	26.04.19

Sl. No.	Description		Test No. 1	Test No. 2	Test No. 3	Spec Limit (%)
1	Wt. of stone pieces (dry) passing IS Sieve 12.5mm but retained in IS sieve 10mm (gm)	(Wa)	396.00	368.00	386.00	
2	Wt. of the fraction retained in IS sieve 2.36mm after the impact test (gm)	(Wb)	307.00	298.00	299.00	
3	Wt. of the fraction passed in IS sieve 2.36mm after the impact test (gm)	(Wc)	89.00	70.00	87.00	
4	Aggregate Impact Value (%)	(Wc/Wa)*100	22.47	19.02	22.54	
5	Average Aggregate impact value	(%)	21.35			Max - 30 %

Remarks : ✓ Satisfactory / Not Satisfactory

Note :

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ಬೃಹತ್ ಬೆಂಗಳೂರು ಮಹಾ ನಗರ ಪಾಲಿಕೆ

ಸಹಾಯಕ ಕಮಿಷನರ್ ಆಧಿಯಂತರು
ಬ್ಯಾಟರಾಯನಪುರ ಉಪ ವಿಭಾಗ
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FLAKINESS AND ELONGATION INDICES (IS 2386, PART 1)

Project :	Improvement to Drains and Asphalting to Roads at Hegadenagara Eastern Side Cross Roads in Ward No.06(Thanisandra), Byatarayanapura Sub Division
Client :	BRUHAT BANGALORE MAHANAGARA PALIKE
Consultant :	M/s Tejus Consultants
Contractor:	Benaka Developers and Project Pvt. Ltd.

Type of Material	BC	Proposed Use	BC
Sample Location	At plant	Date of Sampling	26.04.19
		Date of Testing	26.04.19

Size of aggregate		Flakiness Index		Elongation Index	
Passing through IS sieve, mm	Retained on IS sieve, mm	Total wt. of aggregate retained on sieves (A) gms.	Wt. of aggregate passing from Flakiness gauge (B) gms	Wt. of aggregate retained on Flakiness gauge (C) gms	Wt. of aggregate retained on Elongation gauge after retained on Flakiness gauge(D)gms
63.0	50.0	0	0	0	0
50.0	40.0	0	0	0	0
40.0	31.5	0	0	0	0
31.5	25.0	0	0	0	0
25.0	20.0	0	0	0	0
20.0	16.0	625	76	549	67
16.0	12.5	1206	115	1091	81
12.5	10.0	554	73	481	57
10.0	6.3	498	57	441	47
Total		2883	321	2562	252

Note: Minimum 200 Pcs should be taken on each fraction of test

Flakiness Index(%):	11.13
Elongation Index(%):	9.84
Combined FI+EL (%)	20.97

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FLAKINESS AND ELONGATION INDICES (IS 2386, PART 1)

Project :	Improvement to Drains and Asphalting to Roads at Hegadenagara Eastern Side Cross Roads in Ward No.06(Thanisandra), Byatarayanapura Sub Division
Client :	BRUHAT BANGALORE MAHANAGARA PALIKE
Consultant :	M/s Tejus Consultants
Contractor:	Benaka Developers and Project Pvt. Ltd.

Type of Material	BC	Proposed Use	BC
Sample Location	At plant	Date of Sampling	26.04.19
		Date of Testing	26.04.19

Size of aggregate		Flakiness Index		Elongation Index	
Passing through IS sieve, mm	Retained on IS sieve, mm	Total wt. of aggregate retained on sieves (A) gms.	Wt. of aggregate passing from Flakiness gauge (B) gms	Wt. of aggregate retained on Flakiness gauge (C) gms	Wt. of aggregate retained on Elongation gauge after retained on Flakiness gauge(D)gms
63.0	50.0	0	0	0	0
50.0	40.0	0	0	0	0
40.0	31.5	0	0	0	0
31.5	25.0	0	0	0	0
25.0	20.0	0	0	0	0
20.0	16.0	628	73	555	60
16.0	12.5	1200	112	1088	81
12.5	10.0	552	72	480	58
10.0	6.3	500	56	444	46
Total		2880	313	2567	245

Note: Minimum 200 Pcs should be taken on each fraction of test

Flakiness Index(%):	10.87
Elongation Index(%):	9.54
Combined FI+EL (%)	20.41

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GRADATION FOR BC
(As per MORT&H 500-18,Grading-2)

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Name of Work	:	**Improvement to Drains and Asphalting to Roads at Hegadenagara Eastern Side Cross Roads in Ward No.06(Thanisandra), Byatarayanapura Sub Division**
Client	:	BRUHAT BANGALORE MAHANAGARA PALIKE
Consultant	:	M/s Tejus Consultants
Contractor	:	Benaka Developers and Project Pvt. Ltd.
Date of Testing	:	26.04.19
Type of Mix	:	BC
Sample I/D	:	BC3

Sample Location:	At plant	Date of Sampling:	26.04.19	
Type of material & Purpose:	BC	Date of testing:	26.04.19	
		Oven Dry Wt.(gms):	1200.0	

IS Sieve size in mm	Weight retained	Cummulative weight retained (gm)	Cummulative % of retained	Cummulative % of passing	Specification limits
19.00	0	0	0.00	100.00	100.00
13.20	136	136.0	11.33	88.67	79 - 100
9.50	109	245.0	20.42	79.58	71 - 95
4.75	221	466.0	38.83	61.17	53 - 71
2.360	124	590.0	49.17	50.83	42 - 58
1.180	120	710.0	59.17	40.83	34 - 48
0.600	102	812.0	67.67	32.33	26 - 38
0.300	110	922.0	76.83	23.17	18 - 28
0.150	86	1008.0	84.00	16.00	12 - 20
0.075	94	1102.0	91.83	8.17	4 - 10
Pan	98.0				
Total	1200.0				

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BRUHATH BANGALORE MAHANAGARA PALIKE
BYATARAYANAPURA DIVISION

Name of the work: Improvement to Drains and Asphalting to Roads at Anam Enclave Main Road in Ward No.06(Thanisandra), Byatarayanapura Sub Division

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PRECAST SLAB (CORE) TEST REPORT

Client	:	Bruhat Bangalore Mahanagara Palike
Contractor	:	Benaka Developers and Project Pvt. Ltd.
Name of Work	:	Improvement to Drains and Asphalting to Roads at Anam Enclave Main Road in Ward No.06(Thanisandra), Byatarayanapura Sub Division
No.of Sample Tested	:	3
Date of Testing	:	16.03.19
Technical Reference	:	IS:516-1959 (Reaffirmed 1999), SP-24:1983.
Grade of Concrete	:	M_{20}. 250mm Thick

. No.	Dia of Core D (mm)	Height of Core H (mm)	Core Wt (Kg)	Density of Core (kg / m^3)	H / D	Correction factor (Based on H/D)	Failure Load (kN)	Core Strength (N/mm^2)	Correction Factor for the Dia. (Strength of the Core x 1.08)	Corrected Cylinder Compressive Strength (N/mm^2)	Equivalent Cube Compressive Strength (N/mm^2)
1	250.00	180.00	3.450	390.46	0.72	0.960	158.90	3.24	3.50	3.36	4.20
2	250.00	180.00	3.480	393.86	0.72	0.960	158.80	3.24	3.49	3.35	4.19
3	250.00	180.00	3.470	392.72	0.72	0.960	158.00	3.22	3.48	3.34	4.17

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TEST REPORT

Clients	Bruhath Bangalore Mahanagara Palike
Project	Improvement to Drains and Asphalting to Roads at Anam Enclave Main Road in Ward No 06(Thanisandra), Byatarayanapura Sub Division
Consultants	TEJUS CONSULTANTS Basaveshwar Nagar Bangalore
Contractor	Benaka developers and project pvt ltd
Total Weight in gm:	3000

SIEVE ANALYSIS

Type of Material	40 mm down size	Proposed Use	PCC
Sample Location	At Site/Plant	Date of Sampling	19.03.19
		Date of Testing	19.03.19

IS Sieve Size	Weight Retained in gm	Cum. Weight Retained in gm	Cumulative Weight Retained in %	Cumulative Weight Passing in %	Specific Limits as per IS 383-1970 (RA-2007) % of Passing For Graded Aggregate of Nominal Size
80.00mm	0	0	0.00	100.00	100
63.00mm	0	0	0.00	100.00	-
40.00mm	251	251	8.37	91.63	95-100
20.00mm	1224	1475	49.17	50.83	30-70
10.00mm	943	2418	80.60	19.40	10-35
4.75mm	452	2870	95.67	4.33	0-5
Pan	130	3000	100.00	0.00	

Remarks : ✓ Satisfactory / Not Satisfactory

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TEST REPORT

Clients	Bruhat Bangalore Mahanagara Palike
Project	Improvement to Drains and Asphalting to Roads at Anam Enclave Main Road in Ward No.06(Thanisandra), Byatarayanapura Sub Division
Consultants	Tejus Consultants, Bangalore
Contractor	Benaka developers and project pvt ltd

SIEVE ANALYSIS

Total Weight (gm)	3000	**Proposed Use**	concrete
Type of Material	Fine aggregate (River Sand/ M sand)	**Date of Sampling**	19.03.19
Sample Location	At Site/Plant	**Date of Testing**	19.03.19

IS Sieve Size	Weight Retained	Cum. Weight Retained	Cum. % Retained	Cum. % Passing	Spec. Limit (%) Passing (Zone-II)
10.00 mm	0	0	0	100.00	100
4.75 mm	222	222	7.40	92.60	90 - 100
2.36 mm	312	534	17.80	82.20	75 - 100
1.18 mm	411	945	31.50	68.50	55 - 90
0.600 mm	485	1430	47.67	52.33	35 -59
0.300 mm	718	2148	71.60	28.40	8-30
0.150 mm	624	2772	92.40	7.60	0 - 10
Pan	228	3000			-

Remarks : ✓ Satisfactory / Not Satisfactory

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TEST REPORT

Clients	BRUHAT BENGALORE MAHANAGARA PALIKE
Project	Improvement to Drains and Asphalting to Roads at Anam Enclave Main Road in Ward No.06(Thanisandra), Byatarayanapura Sub Division
Consultants	TEJUS CONSULTANTS Basaveshwar Nagar Bangalore
Contractor	Benaka developers and project pvt ltd

SPECIFIC GRAVITY AND WATER ABSORPTION **FINE**
AGGREGATE (IS-2386-PART-3)

Type of Material	Fine aggregate (River Sand/ M sand)	**26.03.19**	concrete
Location/Source	At Site/Plant	**Date of Sampling**	19.03.19
Period of Soaking	24 hours	**Date of Testing**	19.03.19

Sl. No.	Test Property	TRIAL - 1	TRIAL - 2	TRIAL - 3	
A	222	658	662	642	
B	312	650	651	632	
C	411	1275	1275	1275	
D	485	1690	1692	1680	
E	718 $\frac{B}{(C+A-D)}$	2.675	2.657	2.667	2.666
G	Absorption (%) $\frac{(A-B)*100}{B}$	1.231	1.690	1.582	1.501

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Test Report on Cement	
Project	Improvement to Drains and Asphalting to Roads at Anam Enclave Main Road in Ward No.06(Thanisandra), Byatarayanapura Sub Division
Client	Bruhat Bangalore Mahanagar Palike.
Consultant	TEJUS CONSULTANTS.
Contractor	Benaka developers and project pvt ltd
Sample ID	Cement
Date of Sample Tested	19.03.19
Sample Supplied By	Agency

Sl.No.	Descriptions	Test Method as per IS	Test Result	Requirements as per IS: 12269-1987
1	a) Initial Setting Time	IS-4031 (Part-5)	36 Minutes	Not Less than 30 Minutes
	b) Final Setting Time	IS-4031 (Part-5)	338 Minutes	Not More than 600 Minutes
2	Soundness	IS-4031 (Part-3) By the Le-Chatelier method	4mm	Not More than 10 mm
3	Standard Consistency	IS-4031 (Part-4)	27.00%	25 % to 35

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Test Report on Cement

Project	Improvement to Drains and Asphalting to Roads at Anam Enclave Main Road in Ward No.06(Thanisandra), Byatarayanapura Sub Division
Client	Bruhat Bangalore Mahanagar Palike
Consultant	TEJUS CONSULTANTS
Contractor	Benaka developers and project pvt ltd
Sample ID	Cement
Date of Sample Tested	26.03.19
Sample Supplied By	Agency

Sl.No.	Descriptions	Test Method as per IS	Test Result	Requirements as per IS: 12269-1987
1	a) Initial Setting Time	IS-4031 (Part-5)	37 Minutes	Not Less than 30 Minutes
	b) Final Setting Time	IS-4031 (Part-5)	347 Minutes	Not More than 600 Minutes
2	Soundness	IS-4031 (Part-3) By the Le-Chatelier method	3mm	Not More than 10 mm
3	Standard Consistency	IS-4031 (Part-4)	28.00%	25 % to 35

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TEST REPORT	
Clients	BRUHAT BENGALORE MAHANAGARA PALIKE
Project	Improvement to Drains and Asphalting to Roads at Anam Enclave Main Road in Ward No.06(Thanisandra), Byatarayanapura Sub Division
Consultants	TEJUS CONSULTANTS Basaveshwar Nagar Bangalore
Contractor	Benaka developers and project pvt ltd

SPECIFIC GRAVITY AND WATER ABSORPTION

FINE AGGREGATE (IS-2386-PART-3)

Type of Material	Fine aggregate (River Sand/ M sand)	Proposed Use	concrete
Location/Source	At Site/Plant	Date of Sampling	26.03.19
Period of Soaking	24 hours	Date of Testing	26.03.19

Sl. No.	Test Property	TRIAL - 1	TRIAL - 2	TRIAL - 3	
A	Weight of sturated surface dry sample gm.	648	678	658	
B	Weight of oven - dry sample gm.	641	670	648	
C	Weight of Pycnometer Filled with water gm	1275	1275	1275	
D	Weight of Pycnometer + sample + water gm	1682	1701	1690	
E	Bulk specific gravity $\frac{B}{(C+A-D)}$	2.660	2.659	2.667	2.662
G	Absorption (%) $\frac{(A-B)*100}{B}$	1.092	1.194	1.543	1.276

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TEST REPORT

Clients	Bruhat Bangalore Mahanagara Palike
Project	Improvement to Drains and Asphalting to Roads at Anam Enclave Main Road in Ward No.06(Thanisandra), Byatarayanapura Sub Division
Consultants	Tejus Consultants, Bangalore
Contractor	Benaka developers and project pvt ltd

SIEVE ANALYSIS

Total Weight:	3000 gms		
Type of Material	Fine aggregate (River Sand/ M sand)	**Proposed Use**	concrete
Sample Location	At Site/Plant	**Date of Sampling**	26.03.19
		Date of Testing	26.03.19

IS Sieve Size	Weight Retained	Cum. Weight Retained	Cum. % Retained	Cum. % Passing	Spec. Limit (%) Passing (Zone-II)
10.00 mm	0	0	0	100.00	100
4.75 mm	211	211	7.03	92.97	90 - 100
2.36 mm	307	518	17.27	82.73	75 - 100
1.18 mm	424	942	31.40	68.60	55 - 90
0.600 mm	487	1429	47.63	52.37	35 -59
0.300 mm	712	2141	71.37	28.63	8-30
0.150 mm	632	2773	92.43	7.57	0 - 10
Pan	227	3000			-

Remarks : ✓ Satisfactory / Not Satisfactory

Consultant's Representative

TEJUS CONSULTANTS

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TEST REPORT

Clients	Bruhat Bangalore Mahanagara Palike
Project	Improvement to Drains and Asphalting to Roads at Anam Enclave Main Road in Ward No.06(Thanisandra), Byatarayanapura Sub Division
Consultants	TEJUS CONSULTANTS Basaveshwar Nagar Bangalore
Contractor	Benaka developers and project pvt ltd
Total Weight:	10000 gms

SIEVE ANALYSIS

Type of Material	20 mm down size	**Proposed Use**	PCC
Sample Location	Plant/At site	**Date of Sampling**	26.03.19
		Date of Testing	26.03.19

IS Sieve Size	Weight Retained	Cum. Weight Retained	Cum. % Retained	Cum. % Passing	Spec. Limit (%) Passing
40.00 mm	0	0	0	100	100
20.00 mm	265	265	2.65	97.35	95 - 100
10.00 mm	4831	5096	50.96	49.04	25 - 55
4.75 mm	4227	9323	93.23	6.77	0 - 10
Pan	677	10000			

Remarks : ✓ Satisfactory / Not Satisfactory

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TEST REPORT

Clients	Bruhat Bangalore Mahanagara Palike
Project	Improvement to Drains and Asphalting to Roads at Anam Enclave Main Road in Ward No.06(Thanisandra), Byatarayanapura Sub Division
Consultants	TEJUS CONSULTANTS
Contractor	Benaka developers and project pvt ltd
Total Weight(gm)	10000

SIEVE ANALYSIS

Type of Material	**12.5 mm down size**	**Proposed Use**	PCC	
Sample Location	At Site/Plant	**Date of Sampling**	26.03.19	
		Date of Testing	26.03.19	

IS Sieve Size (in mm)	Weight Retained	Cum. Weight Retained	Cum. % Retained	Cum. % Passing	Spec. Limit (%) Passing
20.0	0	0	0	100	100
12.5	545	545	5.45	94.55	90-100
10.0	4683	5228	52.28	47.72	40-85
4.75	4524	9752	97.52	2.48	0-10
Pan	248	10000			

Remarks : ✓ Satisfactory / Not Satisfactory

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TEST REPORT ON COMPRESSIVE STRENGTH OF CONCRETE CUBES

Project	Improvement to Drains and Asphalting to Roads at Anam Enclave Main Road in Ward No.06(Thanisandra), Byatarayanapura Sub Division
Client	Bruhat Bangalore Mahanagar Palike
Consultant	TEJUS CONSULTANTS
Contractor	Benaka developers and project pvt ltd
Grade of concrete:	M15
Size of cube:	150x150x150 mm
Reference IS code:	IS:516-1959

Sl.No.	Date of Casting	Date of testing	Age of Test	Weight of Cube	Area of Cube	Failure load	Compressive strength	Avg. Compressive strength
				Kg	mm^2	KN	N/mm^2	N/mm^2
1	26.03.19	02.04.19	7 days	8.120	22500	208	9.24	9.35
2	26.03.19	02.04.19	7 days	8.130	22500	211	9.38	
3	26.03.19	02.04.19	7 days	8.140	22500	212	9.42	

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TEST REPORT ON COMPRESSIVE STRENGTH OF CONCRETE CUBES

Project	Improvement to Drains and Asphalting to Roads at Anam Enclave Main Road in Ward No.06(Thanisandra), Byatarayanapura Sub Division
Client	Bruhat Bangalore Mahanagar Palike
Consultant	TEJUS CONSULTANTS
Contractor	Benaka developers and project pvt ltd
Grade of Concrete:	M15
Size of cube:	150x150x150 mm
Reference IS code:	IS:516-1959

Sl.No.	Date of Casting	Date of testing	Age of Test	Weight of Cube	Area of Cube	Failure load	Compressive strength	Avg. Compressive strength
				Kg	mm^2	KN	N/mm^2	N/mm^2
1	26.03.19	24.04.19	28 days	8.122	22500	343	15.24	15.27
2	26.03.19	24.04.19	28 days	8.132	22500	341	15.16	
3	26.03.19	24.04.19	28 days	8.146	22500	347	15.42	

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AGGREGATE IMPACT VALUE
(IS: 2386 Part - 4)

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oject	Improvement to Drains and Asphalting to Roads at Anam Enclave Main Road in Ward No.06(Thanisandra), Byatarayanapura Sub Division		
ent	BRUHAT BANGALORE MAHANAGARA PALIKE		
nsultant	M/s Tejus Consultants		
ntractor	Benaka Developers and Project Pvt. Ltd.		
oposed e	WMM	**Date of Sampling**	**04.04.19**
mple cation	**At plant**	**Date of Testing**	**04.04.19**

No.	Description		Test No. 1	Test No. 2	Test No. 3	Spec Limit (%)
1	Wt. of stone pieces (dry) passing IS Sieve 12.5mm but retained in IS sieve 10mm (gm)	(Wa)	336.00	381.00	344.00	
2	Wt. of the fraction retained in IS sieve 2.36mm after the impact test (gm)	(Wb)	287.00	293.00	274.00	
3	Wt. of the fraction passed in IS sieve 2.36mm after the impact test (gm)	(Wc)	49.00	88.00	70.00	
4	Aggregate Impact Value (%)	(Wc/Wa)* 100	14.58	23.10	20.35	
5	Average Aggregate impact value	(%)	19.34			Max - 30 %

narks : ✓ Satisfactory / Not Satisfactory

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AGGREGATE IMPACT VALUE
(IS: 2386 Part - 4)

TEJUS CONSULTANTS

oject	Improvement to Drains and Asphalting to Roads at Anam Enclave Main Road in Ward No.06(Thanisandra), Byatarayanapura Sub Division		
ient	BRUHAT BANGALORE MAHANAGARA PALIKE		
nsultant	M/s Tejus Consultants		
ntractor	Benaka Developers and Project Pvt. Ltd.		
oposed e	WMM	**Date of Sampling**	**04.04.19**
mple cation	At plant	**Date of Testing**	**04.04.19**

No.	Description		Test No. 1	Test No. 2	Test No. 3	Spec Limit (%)
1	Wt. of stone pieces (dry) passing IS Sieve 12.5mm but retained in IS sieve 10mm (gm)	(Wa)	363.00	381.00	346.00	
2	Wt. of the fraction retained in IS sieve 2.36mm after the impact test (gm)	(Wb)	286.00	293.00	273.00	
3	Wt. of the fraction passed in IS sieve 2.36mm after the impact test (gm)	(Wc)	77.00	88.00	73.00	
4	Aggregate Impact Value (%)	(Wc/Wa)* 100	21.21	23.10	21.10	
5	Average Aggregate impact value	(%)	21.80			Max - 30 %

narks : ✓ Satisfactory / Not Satisfactory

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FLAKINESS AND ELONGATION INDICES (IS 2386, PART 1)

Project	Improvement to Drains and Asphalting to Roads at Anam Enclave Main Road in Ward No.06(Thanisandra), Byatarayanapura Sub Division
Client	BRUHAT BANGALORE MAHANAGARA PALIKE
Consultant	M/s Tejus Consultants
Contractor	Benaka Developers and Project Pvt. Ltd.

Type of Material	WMM	**Proposed Use**	WMM
Sample Location	At plant	**Date of Sampling**	04.04.19
		Date of Testing	04.04.19

Size of aggregate		**Flakiness Index**		**Elongation Index**	
Passing through IS sieve, mm	**Retained on IS sieve, mm**	**Total wt. of aggregate retained on sieves (A) gms.**	**Wt. of aggregate passing from Flakiness gauge (B) gms**	**Wt. of aggregate retained on Flakiness gauge (C) gms**	**Wt. of aggregate retained on Elongation gauge after retained on Flakiness gauge(D)gms**
63.0	50.0	0	0	0	0
50.0	40.0	0	0	0	0
40.0	31.5	0	0	0	0
31.5	25.0	0	0	0	0
25.0	20.0	0	0	0	0
20.0	16.0	852	72	780	55
16.0	12.5	1203	114	1089	126
12.5	10.0	453	76	377	64
10.0	6.3	501	66	435	40
Total		**3009**	**328**	**2681**	**285**

Note: Minimum 200 Pcs should be taken on each fraction of test

Flakiness Index(%):	10.90
Elongation Index(%):	10.63
Combined FI+EL (%)	21.53

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FLAKINESS AND ELONGATION INDICES (IS 2386, PART 1)

Project	Improvement to Drains and Asphalting to Roads at Anam Enclave Main Road in Ward No.06(Thanisandra), Byatarayanapura Sub Division
Client	BRUHAT BANGALORE MAHANAGARA PALIKE
Consultant	M/s Tejus Consultants
Contractor	Benaka Developers and Project Pvt. Ltd.

Type of Material	WMM	**Proposed Use**	WMM
Sample Location	At plant	**Date of Sampling**	04.04.19
		Date of Testing	04.04.19

Size of aggregate		**Flakiness Index**		**Elongation Index**	
Passing through IS sieve, mm	**Retained on IS sieve, mm**	**Total wt. of aggregate retained on sieves (A) gms.**	**Wt. of aggregate passing from Flakiness gauge (B) gms**	**Wt. of aggregate retained on Flakiness gauge (C) gms**	**Wt. of aggregate retained on Elongation gauge after retained on Flakiness gauge(D)gms**
63.0	50.0	0	0	0	0
50.0	40.0	0	0	0	0
40.0	31.5	0	0	0	0
31.5	25.0	0	0	0	0
25.0	20.0	0	0	0	0
20.0	16.0	852	73	779	55
16.0	12.5	1201	113	1088	126
12.5	10.0	451	73	378	64
10.0	6.3	499	67	432	40
Total		**3003**	**326**	**2677**	**285**

Note: Minimum 200 Pcs should be taken on each fraction of test

Flakiness Index(%):	10.86
Elongation Index(%):	10.65
Combined FI+EL (%)	21.50

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GRADATION FOR WMM
(As per MORT&H 400-11)

Name of Work	:	Improvement to Drains and Asphalting to Roads at Anam Enclave Main Road in Ward No.06(Thanisandra), Byatarayanapura Sub Division
Client	:	BRUHAT BANGALORE MAHANAGARA PALIKE
Consultant	:	M/s Tejus Consultants
Contractor	:	Benaka Developers and Project Pvt. Ltd.
Date of Testing	:	04.04.19
Type of Mix	:	WMM
Sample I/D	:	WMM 1

Sample Location:	At plant	Date of Sampling:	04.04.19
Type of material & Purpose:	WMM	Date of testing:	04.04.19
		Oven Dry Wt.(gms):	10000.0

S Sieve size in mm	Weight retained (gm)	Cummulative weight retained (gm)	Cummulative % of retained	Cummulative % of passing	Specification limits
53	0	0	0.00	100.00	100.00
45	816	816	8.16	91.84	95-100
22.4	2543	3359	33.59	66.41	60-80
11.2	1785	5144	51.44	48.56	40-60
4.75	1229	6373	63.73	36.27	25-40
2.36	1331	7704	77.04	22.96	15-30
0.6	871	8575	85.75	14.25	8.0-22.0
0.075	852	9427	94.27	5.73	0-8
Pan	573				
Total	10000				

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GRADATION FOR WMM
(As per MORT&H 400-11)

Name of Work	:	Improvement to Drains and Asphalting to Roads at Anam Enclave Main Road in Ward No.06(Thanisandra), Byatarayanapura Sub Division
Client	:	BRUHAT BANGALORE MAHANAGARA PALIKE
Consultant	:	M/s Tejus Consultants
Contractor	:	Benaka Developers and Project Pvt. Ltd.
Date of Testing	:	04.04.19
Type of Mix	:	WMM
Sample I/D	:	WMM 1

Sample Location:	At plant	Date of Sampling:	04.04.19
Type of material & Purpose:	WMM	Date of testing:	04.04.19
		Oven Dry Wt.(gms):	10000.0

IS Sieve size in mm	Weight retained (gm)	Cummulative weight retained (gm)	Cummulative % of retained	Cummulative % of passing	Specification limits
53	0	0	0.00	100.00	100.00
45	817	817	8.17	91.83	95-100
22.4	2541	3358	33.58	66.42	60-80
11.2	1783	5141	51.41	48.59	40-60
4.75	1331	6472	64.72	35.28	25-40
2.36	1330	7802	78.02	21.98	15-30
0.6	870	8672	86.72	13.28	8.0-22.0
0.075	853	9525	95.25	4.75	0-8
Pan	475				
Total	10000				

ote:
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ceived in the laboratory/Site.
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ಸಹಾಯಕ ಅಧಿಯಂತರರು
ಬ್ಯಾಟರಾಯನಪುರ ಉಪ ವಿಭಾಗ
ಬಿ.ಬಿ.ಎಂ.ಪಿ

ಸಹಾಯಕ ಕಾರ್ಯಪಾಲಕ ಅಭಿಯಂತರರು
ಬ್ಯಾಟರಾಯನಪುರ ಉಪ ವಿಭಾಗ
ಬಿ.ಬಿ.ಎಂ.ಪಿ. ಬೆಂಗಳೂರು-26

TEJUS CONSULTANTS
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Project	Improvement to Drains and Asphalting to Roads at Anjan Enclave Main Road in Ward No.06(Thanisandra), Byatarayanapura Sub Division
Client	BRUHAT BANGALORE MAHANAGARA PALIKE
Consultant	M/s Tejus Consultants
Contractor	Benaka Developers and Project Pvt. Ltd.

Field Dry Density test by Sand Replacement Method (As per IS 2720 (Part 28)

)ate of Testing	05.04.19
.ayer no. or level	WMM I layer
)epth of hole	250mm

ield density:	1	2	3
't. of wet material from hole (Ww) gms.	6164	6121	6232
't. of sand+cylinder before pouring (w1) gms.	14000	14000	14000
t. of sand+cylinder after pouring (w2) gms.	9735	9736	9716
t. of sand in cone (w3) gms.	835	842	830
t. of sand in hole (w4)=(w1-w2-w3) gms.	3430	3422	3454
ılk density of sand (γs)gm/cc	1.31	1.32	1.31
ılk density of material(i.e. wt. of the wet ıterial) (γb)=(Ww/w4*(γs))gm/cc	2.35	2.36	2.36
ısture meter reading(moisture content)	12.50	12.60	12.58
sult			
D(Wt.of the dry material)=(100γb/100+mc)gm/cc	2.09	2.10	2.10
D	2.13	2.13	2.13
C	12.60%	12.60%	12.60%
f Compaction Obtained	98.24	98.45	98.57
ıpaction Required	98%	98%	98%

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ıe results indicated above are based on the tests carried out on the samples
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ಸಹಾಯಕ ಅಧಿಯಂತರರು
ಬಿ.ಬಿ.ಎಂ.ಪಿ ಬ್ಯಾಟರಾಯನಪುರ ಉಪ ವಿಭಾಗ

ಸಹಾಯಕ ಕಾರ್ಯ ಪಾಲಕ ಅಧಿಯಂತರರು
ಬ್ಯಾಟರಾಯನಪುರ ಉಪ ವಿಭಾಗ
ಬಿ.ಬಿ.ಎಂ.ಪಿ., ಬೆಂಗಳೂರು

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Project	Improvement to Drains and Asphalting to Roads at Anam Enclave Main Road in Ward No.06(Thanisandra), Byatarayanapura Sub Division
Client	BRUHAT BANGALORE MAHANAGARA PALIKE
Consultant	M/s Tejus Consultants
Contractor	Benaka Developers and Project Pvt. Ltd.

Field Dry Density test by Sand Replacement Method (As per IS 2720 (Part 28)

Date of Testing	05.04.19
Layer no. or level	WMM I layer
Depth of hole	250mm

Field density:	1	2	3
Wt. of wet material from hole (Ww) gms.	6163	6122	6233
Wt. of sand+cylinder before pouring (w1) gms.	14000	14000	14000
Wt. of sand+cylinder after pouring (w2) gms.	9735	9736	9716
Wt. of sand in cone (w3) gms.	835	842	830
Wt. of sand in hole (w4)=(w1-w2-w3) gms.	3430	3422	3454
Bulk density of sand (γs)gm/cc	1.31	1.32	1.31
Bulk density of material(i.e. wt. of the wet material) (γb)=(Ww/w4*(γs))gm/cc	2.35	2.36	2.36
Moisture meter reading(moisture content)	12.50	12.60	12.58
Result			
FDD(Wt.of the dry material)=(100γb/100+mc)gm/cc	2.09	2.10	2.10
MDD	2.13	2.13	2.13
OMC	12.60%	12.60%	12.60%
% of Compaction Obtained	98.23	98.46	98.58
Compaction Required	98%	98%	98%

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